Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. (Previously Presented) An epoxy resin composite formed article composed of an epoxy resin and fibers,

wherein the fibers are arranged along a first plane and molecular chains of the epoxy resin are oriented in a direction intersecting with the first plane therein,

wherein a degree of orientation α of the molecular chains of the epoxy resin is in a range of 0.5 or more and less than 1, as determined by the following expression (1) based on X-ray diffraction measurement,

$$\text{Degree of orientation } \alpha = (180\text{-}\Delta\beta/180) \quad (1)$$

wherein $\Delta\beta$ represents a full width at half maximum in an intensity distribution measured in an azimuth angle direction from 0 to 360° at a fixed peak scatter angle in the X-ray diffraction measurement, and

wherein each of the thermal expansion coefficients of the epoxy resin composite formed article in the direction along the first plane and in the direction intersecting with the first plane is in a range of 5×10^{-6} to 50×10^{-6} (/K) and a difference between the thermal expansion coefficients in the direction along the first plane and in the direction intersecting with the first plane is 30×10^{-6} (/K) or less.

2. (Previously Presented) The epoxy resin composite formed article according to claim 1, wherein the epoxy resin is a liquid crystalline epoxy resin having a mesogen group in its molecular.

3. (Previously Presented) The epoxy resin composite formed article according to claim 1, wherein the fibers comprise at least one of a fiber cloth and single fibers.

4. (Previously Presented) The epoxy resin composite formed article according to claim 1, wherein the fibers consist of at least one selected from glass fibers, ceramic fibers, carbon fibers, metal fibers, and organic fibers.

5. (Previously Presented) A printed wiring board comprising:

an epoxy resin composite formed article composed of an epoxy resin and fibers, wherein the fibers are arranged along a first plane and molecular chains of the epoxy resin are oriented in a direction intersecting with the first plane therein, wherein a degree of orientation α of the molecular chains of the epoxy resin is in a range of 0.5 or more and less than 1, as determined by the following expression (1) based on X-ray diffraction measurement,

$$\text{Degree of orientation } \alpha = (180\text{-}\Delta\beta/180) \quad (1)$$

wherein $\Delta\beta$ represents a full width at half maximum in an intensity distribution measured in an azimuth angle direction from 0 to 360° at a fixed peak scatter angle in the X-ray diffraction measurement, and wherein each of the thermal expansion coefficients of the epoxy resin composite formed article in the direction along the first plane and in the direction intersecting with the first plane is in a range of 5×10^{-6} to 50×10^{-6} (/K) and a difference between the thermal expansion coefficients in the direction along the first plane and in the direction intersecting with the first plane is 30×10^{-6} (/K) or less, and

an electrically conductive layer provided on at least one of a surface and inside of the epoxy resin composite formed article.

6. (Withdrawn) A method for producing the epoxy resin composite formed article composed of an epoxy resin and fibers, wherein the fibers are arranged along a first plane and molecular chains of the epoxy resin are oriented in a direction intersecting with the first plane therein, wherein a degree of orientation α of the molecular chains of the epoxy resin is in a range of 0.5 or more and less than 1, as determined by the following expression (1) based on X-ray diffraction measurement,

$$\text{Degree of orientation } \alpha = (180\text{-}\Delta\beta/180) \quad (1)$$

wherein $\Delta\beta$ represents a full width at half maximum in an intensity distribution measured in an azimuth angle direction from 0 to 360° at a fixed peak scatter angle in the X-ray diffraction

measurement, and wherein each of the thermal expansion coefficients of the epoxy resin composite formed article in the direction along the first plane and in the direction intersecting with the first plane is in a range of 5×10^{-6} to 50×10^{-6} (/K) and a difference between the thermal expansion coefficients in the direction along the first plane and in the direction intersecting with the first plane is 30×10^{-6} (/K) or less, said method comprising the steps of:

disposing the fibers within a cavity of a mold in such a manner that the fibers are arranged along the first plane,

impregnating the fibers with an epoxy resin composition by filling the cavity of the mold with the epoxy resin composition,

orienting molecular chains of the epoxy resin in a direction intersecting with the first plane, and

curing the epoxy resin composition while the orientation of the molecular chains of the epoxy resin is maintained.

7. (Withdrawn) The method according to claim 6, wherein in the step of orienting the molecular chains of the epoxy resin, the orientation of the molecular chains of the epoxy resin is accomplished by application of a magnetic field thereto.

8. (Withdrawn) A method for producing the printed wiring board including an epoxy resin composite formed article composed of an epoxy resin and fibers, wherein the fibers are arranged along a first plane and molecular chains of the epoxy resin are oriented in a direction intersecting with the first plane therein, wherein a degree of orientation α of the molecular chains of the epoxy resin is in a range of 0.5 or more and less than 1, as determined by the following expression (1) based on X-ray diffraction measurement,

$$\text{Degree of orientation } \alpha = (180\text{-}\Delta\beta/180) \quad (1)$$

wherein $\Delta\beta$ represents a full width at half maximum in an intensity distribution measured in an azimuth angle direction from 0 to 360° at a fixed peak scatter angle in the X-ray diffraction measurement, and wherein each of the thermal expansion coefficients of the epoxy resin composite formed article in the direction along the first plane and in the direction intersecting with the first plane is in a range of 5×10^{-6} to 50×10^{-6} (/K) and a difference between the thermal

expansion coefficients in the direction along the first plane and in the direction intersecting with the first plane is 30×10^{-6} (/K) or less; and an electrically conductive layer provided on at least one of a surface and inside of the epoxy resin composite formed article, said method comprising the steps of:

disposing the fibers within a cavity of a mold in such a manner that the fibers are arranged along the first plane,

impregnating the fibers with an epoxy resin composition by filling the cavity of the mold with the epoxy resin composition,

orienting molecular chains of the epoxy resin in a direction intersecting with the first plane,

curing the epoxy resin composition while the orientation of the molecular chains of the epoxy resin is maintained, and

providing an electrically conductive layer on at least one of a surface and inside of the printed wiring board at least either prior to the step of disposing, or after the steps of impregnating, or curing.

9. (Withdrawn) The method according to claim 8, wherein in the step of orienting, the orientation of the molecular chains of the epoxy resin is accomplished by application of a magnetic field thereto.

10. (Withdrawn) A method for producing the epoxy resin composite formed article composed of an epoxy resin and fibers, wherein the fibers are arranged along a first plane and molecular chains of the epoxy resin are oriented in a direction intersecting with the first plane therein, wherein a degree of orientation α of the molecular chains of the epoxy resin is in a range of 0.5 or more and less than 1, as determined by the following expression (1) based on X-ray diffraction measurement,

$$\text{Degree of orientation } \alpha = (180\text{-}\Delta\beta/180) \quad (1)$$

wherein $\Delta\beta$ represents a full width at half maximum in an intensity distribution measured in an azimuth angle direction from 0 to 360° at a fixed peak scatter angle in the X-ray diffraction measurement, and wherein each of the thermal expansion coefficients of the epoxy resin

composite formed article in the direction along the first plane and in the direction intersecting with the first plane is in a range of 5×10^{-6} to 50×10^{-6} (/K) and a difference between the thermal expansion coefficients in the direction along the first plane and in the direction intersecting with the first plane is 30×10^{-6} (/K) or less, said method comprising the steps of:

preparing an epoxy resin composition containing the fibers,

filing a cavity of a mold with the epoxy resin composition in such a manner that a major axis of each of the fibers are arranged along the first plane,

orienting molecular chains of the epoxy resin in a direction intersecting with the first plane, and

curing the epoxy resin composition, while the orientation of the molecular chains of the epoxy resin is maintained.

11. (Previously Presented) A thermoplastic polymer composite formed article composed of a thermoplastic polymer and fibers, wherein the fibers are arranged along a first plane and molecular chains of the thermoplastic polymer are oriented in a direction intersecting with the first plane therein,

wherein a degree of orientation α of the molecular chains of the thermoplastic polymer is in a range of 0.5 or more and less than 1, as determined by the following expression (1) based on X-ray diffraction measurement,

$$\text{Degree of orientation } \alpha = (180\text{-}\Delta\beta/180) \quad (1)$$

wherein $\Delta\beta$ represents a full width at half maximum in an intensity distribution measured in an azimuth angle direction from 0 to 360° with a fixed peak scatter angle in the X-ray diffraction measurement, and

wherein each of the thermal expansion coefficients of the thermoplastic polymer composite formed article in the direction along to the first plane and in the direction intersecting with the first plane is in a range of 5×10^{-6} to 50×10^{-6} (/K) and a difference between the thermal expansion coefficients in the direction along the first plane and in the direction intersecting with the first plane is 30×10^{-6} (/K) or less.

12. (Previously Presented) The thermoplastic polymer composite formed article according to claim 11, wherein the thermoplastic polymer is a liquid crystalline polymer having a mesogen group in its molecular.

13. (Previously Presented) The thermoplastic polymer composite formed article according to claims 12, wherein the liquid crystalline polymer is at least one selected from aromatic polyester, aromatic polyamide, and aromatic polyesteramide.

14. (Previously Presented) The thermoplastic polymer composite formed article according to claim 11, wherein the fibers comprise at least one of a fiber cloth and single fibers.

15. (Previously Presented) The thermoplastic polymer composite formed article according to claim 11, wherein the fibers consist of at least one selected from glass fibers, ceramic fibers, carbon fibers, metal fibers, and organic fibers.

16. (Previously Presented) A printed wiring board formed of the thermoplastic polymer composite formed article comprising:

a thermoplastic polymer composite formed article composed of a thermoplastic polymer and fibers, wherein the fibers are arranged along a first plane and molecular chains of the thermoplastic polymer are oriented in a direction intersecting with the first plane therein, wherein a degree of orientation α of the molecular chains of the thermoplastic polymer is in a range of 0.5 or more and less than 1, as determined by the following expression (1) based on X-ray diffraction measurement,

$$\text{Degree of orientation } \alpha = (180\text{-}\Delta\beta/180) \quad (1)$$

wherein $\Delta\beta$ represents a full width at half maximum in an intensity distribution measured in an azimuth angle direction from 0 to 360° with a fixed peak scatter angle in the X-ray diffraction measurement, and wherein each of the thermal expansion coefficients of the thermoplastic polymer composite formed article in the direction along to the first plane and in the direction intersecting with the first plane is in a range of 5×10^{-6} to 50×10^{-6} (/K) and a difference

between the thermal expansion coefficients in the direction along the first plane and in the direction intersecting with the first plane is 30×10^{-6} (/K) or less; and

an electrically conductive layer ~~is~~ provided on at least one of a surface and inside of the thermoplastic polymer composite formed article.

17. (Withdrawn) A method for producing the thermoplastic polymer composite formed article composed of a thermoplastic polymer and fibers, wherein the fibers are arranged along a first plane and molecular chains of the thermoplastic polymer are oriented in a direction intersecting with the first plane therein, wherein a degree of orientation α of the molecular chains of the thermoplastic polymer is in a range of 0.5 or more and less than 1, as determined by the following expression (1) based on X-ray diffraction measurement,

$$\text{Degree of orientation } \alpha = (180\text{-}\Delta\beta/180) \quad (1)$$

wherein $\Delta\beta$ represents a full width at half maximum in an intensity distribution measured in an azimuth angle direction from 0 to 360° with a fixed peak scatter angle in the X-ray diffraction measurement, and wherein each of the thermal expansion coefficients of the thermoplastic polymer composite formed article in the direction along to the first plane and in the direction intersecting with the first plane is in a range of 5×10^{-6} to 50×10^{-6} (/K) and a difference between the thermal expansion coefficients in the direction along the first plane and in the direction intersecting with the first plane is 30×10^{-6} (/K) or less, said method comprising the steps of:

disposing the fibers within a cavity of a mold in such a manner that the fibers are arranged along the first plane,

impregnating the fibers with a thermoplastic polymer composition by filling the cavity of the mold with the thermoplastic polymer composition,

orienting molecular chains of the thermoplastic polymer in a direction intersecting with the first plane, and

solidifying the thermoplastic polymer composition while the orientation of the molecular chains of the thermoplastic polymer is maintained.

18. (Withdrawn) A method for producing the thermoplastic polymer composite formed article composed of a thermoplastic polymer and fibers, wherein the fibers are arranged along a first plane and molecular chains of the thermoplastic polymer are oriented in a direction intersecting with the first plane therein, wherein a degree of orientation α of the molecular chains of the thermoplastic polymer is in a range of 0.5 or more and less than 1, as determined by the following expression (1) based on X-ray diffraction measurement,

$$\text{Degree of orientation } \alpha = (180\text{-}\Delta\beta/180) \quad (1)$$

wherein $\Delta\beta$ represents a full width at half maximum in an intensity distribution measured in an azimuth angle direction from 0 to 360° with a fixed peak scatter angle in the X-ray diffraction measurement, and wherein each of the thermal expansion coefficients of the thermoplastic polymer composite formed article in the direction along to the first plane and in the direction intersecting with the first plane is in a range of 5×10^{-6} to 50×10^{-6} (/K) and a difference between the thermal expansion coefficients in the direction along the first plane and in the direction intersecting with the first plane is 30×10^{-6} (/K) or less, said method comprising the steps of:

forming a preform of a thermoplastic polymer composition containing the thermoplastic polymer,

disposing the preform and the fibers within a cavity of a mold in such a manner the preform and the fibers are arranged along the first plane,

impregnating the fibers with a thermoplastic polymer composition by melting the preform,

orienting molecular chains of the thermoplastic polymer in a direction intersecting with the first plane, and

solidifying the thermoplastic polymer composition while the orientation of the molecular chains of the thermoplastic polymer is maintained.

19. (Withdrawn) A method for producing the thermoplastic polymer composite formed article composed of a thermoplastic polymer and fibers, wherein the fibers are arranged along a first plane and molecular chains of the thermoplastic polymer are oriented in a direction intersecting with the first plane therein, wherein a degree of orientation α of the molecular chains

of the thermoplastic polymer is in a range of 0.5 or more and less than 1, as determined by the following expression (1) based on X-ray diffraction measurement,

$$\text{Degree of orientation } \alpha = (180\text{-}\Delta\beta/180) \quad (1)$$

wherein $\Delta\beta$ represents a full width at half maximum in an intensity distribution measured in an azimuth angle direction from 0 to 360° with a fixed peak scatter angle in the X-ray diffraction measurement, and wherein each of the thermal expansion coefficients of the thermoplastic polymer composite formed article in the direction along to the first plane and in the direction intersecting with the first plane is in a range of 5×10^{-6} to 50×10^{-6} (/K) and a difference between the thermal expansion coefficients in the direction along the first plane and in the direction intersecting with the first plane is 30×10^{-6} (/K) or less, said method comprising the steps of:

preparing a thermoplastic polymer composition containing the thermoplastic polymer and the fibers,

filing a cavity of a mold with the thermoplastic polymer composition in such a manner that a major axis of each of the fibers are arranged along the first plane,

orienting molecular chains of the thermoplastic polymer in a direction intersecting with the first plane, and

solidifying the thermoplastic polymer composition, while the orientation of the molecular chains of the thermoplastic polymer is maintained.

20. (Withdrawn) The method according to claim 17, wherein in the step of orienting the molecular chains of the thermoplastic polymer in the direction intersecting with the first plane, the orientation of the molecular chains of the thermoplastic polymer is accomplished by application of a magnetic field thereto.

21. (Withdrawn) A method for producing the printed wiring board including a thermoplastic polymer composite formed article composed of a thermoplastic polymer and fibers, wherein the fibers are arranged along a first plane and molecular chains of the thermoplastic polymer are oriented in a direction intersecting with the first plane therein, wherein a degree of orientation α of the molecular chains of the thermoplastic polymer is in a range of 0.5

or more and less than 1, as determined by the following expression (1) based on X-ray diffraction measurement,

Degree of orientation $\alpha = (180\text{-}\Delta\beta/180)$ (1)

wherein $\Delta\beta$ represents a full width at half maximum in an intensity distribution measured in an azimuth angle direction from 0 to 360° with a fixed peak scatter angle in the X-ray diffraction measurement, and wherein each of the thermal expansion coefficients of the thermoplastic polymer composite formed article in the direction along to the first plane and in the direction intersecting with the first plane is in a range of 5×10^{-6} to 50×10^{-6} (/K) and a difference between the thermal expansion coefficients in the direction along the first plane and in the direction intersecting with the first plane is 30×10^{-6} (/K) or less; and an electrically conductive layer provided on at least one of a surface and inside of the thermoplastic polymer composite formed article, said method comprising the steps of:

disposing the fibers within a cavity of a mold in such a manner that the fibers are arranged along the first plane,

impregnating the fibers with a thermoplastic polymer composition by filling the cavity of the mold with the thermoplastic polymer composition,

orienting molecular chains of the thermoplastic polymer in a direction intersecting with the first plane,

solidifying the thermoplastic polymer composition while the orientation of the molecular chains of the thermoplastic polymer is maintained, and

providing an electrically conductive layer on at least one of a surface and inside of the printed wiring board at least either prior to the step of disposing, or after the steps of impregnating, or solidifying.

22. (Withdrawn) A method for producing the printed wiring board including a thermoplastic polymer composite formed article composed of a thermoplastic polymer and fibers, wherein the fibers are arranged along a first plane and molecular chains of the thermoplastic polymer are oriented in a direction intersecting with the first plane therein, wherein a degree of orientation α of the molecular chains of the thermoplastic polymer is in a range of 0.5

or more and less than 1, as determined by the following expression (1) based on X-ray diffraction measurement,

$$\text{Degree of orientation } \alpha = (180\text{-}\Delta\beta/180) \quad (1)$$

wherein $\Delta\beta$ represents a full width at half maximum in an intensity distribution measured in an azimuth angle direction from 0 to 360° with a fixed peak scatter angle in the X-ray diffraction measurement, and wherein each of the thermal expansion coefficients of the thermoplastic polymer composite formed article in the direction along to the first plane and in the direction intersecting with the first plane is in a range of 5×10^{-6} to 50×10^{-6} (/K) and a difference between the thermal expansion coefficients in the direction along the first plane and in the direction intersecting with the first plane is 30×10^{-6} (/K) or less; and an electrically conductive layer provided on at least one of a surface and inside of the thermoplastic polymer composite formed article, said method comprising the steps of:

forming a preform of a thermoplastic polymer composition containing the thermoplastic polymer,

disposing the preform and the fibers within a cavity of a mold in such a manner the preform and the fibers are arranged along the first plane,

impregnating the fibers with an thermoplastic polymer composition by melting the preform,

orienting molecular chains of the thermoplastic polymer in a direction intersecting with the first plane,

solidifying the thermoplastic polymer composition while the orientation of the molecular chains of the thermoplastic polymer is maintained, and

providing an electrically conductive layer on at least one of a surface and inside of the printed wiring board at least either prior to the step of disposing, or after the steps of impregnating, or solidifying.

23. (Withdrawn) A method for producing the printed wiring board according to claim 16, including a thermoplastic polymer composite formed article composed of a thermoplastic polymer and fibers, wherein the fibers are arranged along a first plane and molecular chains of the thermoplastic polymer are oriented in a direction intersecting with the first plane therein,

wherein a degree of orientation α of the molecular chains of the thermoplastic polymer is in a range of 0.5 or more and less than 1, as determined by the following expression (1) based on X-ray diffraction measurement,

$$\text{Degree of orientation } \alpha = (180\text{-}\Delta\beta/180) \quad (1)$$

wherein $\Delta\beta$ represents a full width at half maximum in an intensity distribution measured in an azimuth angle direction from 0 to 360° with a fixed peak scatter angle in the X-ray diffraction measurement, and wherein each of the thermal expansion coefficients of the thermoplastic polymer composite formed article in the direction along to the first plane and in the direction intersecting with the first plane is in a range of 5×10^{-6} to 50×10^{-6} (/K) and a difference between the thermal expansion coefficients in the direction along the first plane and in the direction intersecting with the first plane is 30×10^{-6} (/K) or less; and an electrically conductive layer provided on at least one of a surface and inside of the thermoplastic polymer composite formed article, said method comprising the steps of:

preparing a thermoplastic polymer composition containing the thermoplastic polymer and the fibers,

filing a cavity of a mold with the thermoplastic polymer composition in such a manner that a major axis of each of the fibers are arranged along the first plane,

orienting molecular chains of the thermoplastic polymer in a direction intersecting with the first plane, and

solidifying the thermoplastic polymer composition, while the orientation of the molecular chains of the thermoplastic polymer is maintained, and

providing an electrically conductive layer on at least one of a surface and inside of the printed wiring board at least either prior to the step of disposing, or after the steps of impregnating, or solidifying.

24. (Withdrawn) The method according to claim 21, wherein in the step of orienting the molecular chains of the thermoplastic polymer in the direction intersecting with the first plane, the orientation of the molecular chains of the thermoplastic polymer is accomplished by application of a magnetic field thereto.

25. (Previously Presented) A polymer composite formed article composed of a polymer and fibers,

wherein the fibers are arranged along a first plane and molecular chains of the polymer are oriented in a direction intersecting with the first plane therein,

wherein a degree of orientation α of the molecular chains of the polymer is in a range of 0.5 or more and less than 1, as determined by the following expression (1) based on X-ray diffraction measurement,

$$\text{Degree of orientation } \alpha = (180\text{-}\Delta\beta/180) \quad (1)$$

wherein $\Delta\beta$ represents a full width at half maximum in an intensity distribution measured in an azimuth angle direction from 0 to 360° with a fixed peak scatter angle in the X-ray diffraction measurement, and

wherein each of the thermal expansion coefficients of the polymer composite formed article in the direction along the first plane and in the direction intersecting with the first plane is in a range of 5×10^{-6} to 50×10^{-6} (/K) and a difference between the thermal expansion coefficients in the direction along the first plane and in the direction intersecting with the first plane is 30×10^{-6} (/K) or less.

26. (Withdrawn) The method according to claim 18, wherein in the step of orienting the molecular chains of the thermoplastic polymer in the direction intersecting with the first plane, the orientation of the molecular chains of the thermoplastic polymer is accomplished by application of a magnetic field thereto.

27. (Withdrawn) The method according to claim 19, wherein in the step of orienting the molecular chains of the thermoplastic polymer in the direction intersecting with the first plane, the orientation of the molecular chains of the thermoplastic polymer is accomplished by application of a magnetic field thereto.

28. (Withdrawn) The method according to claim 22, wherein in the step of orienting the molecular chains of the thermoplastic polymer in the direction intersecting with the first

plane, the orientation of the molecular chains of the thermoplastic polymer is accomplished by application of a magnetic field thereto.

29. (Withdrawn) The method according to claim 23, wherein in the step of orienting the molecular chains of the thermoplastic polymer in the direction intersecting with the first plane, the orientation of the molecular chains of the thermoplastic polymer is accomplished by application of a magnetic field thereto.